

**APPLICATION FOR UNITED STATES LETTERS PATENT**

**TITLE: DUST CONTAINER FOR VACUUM CLEANER**

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# DUST CONTAINER FOR VACUUM CLEANER

## REFERENCE TO RELATED APPLICATION

This application claims priority to copending Korean Patent Application No.  
5 2003-63141, filed September 9, 2003 in the Korean Intellectual Property Office, the  
disclosure of which is entirely incorporated herein by reference.

## FIELD OF THE INVENTION

The present invention generally relates to a vacuum cleaner, and more  
10 specifically, to a dust container for a vacuum cleaner, having a handle which  
mechanically recovers to a seated position with the closing movement of the dust  
container.

## BACKGROUND OF THE INVENTION

15 Generally, a commercial vacuum cleaner having a wide-area coverage requires  
a larger dust container in comparison to a vacuum cleaner used in a residence. Hence,  
the commercial vacuum cleaner usually has a dust container as a cleaner body to  
remove the need for a dust bag. In such a vacuum cleaner, in order to empty the  
collected contaminants, a user experiences an inconvenience in separating a bulky  
20 cleaner body from a suction motor unit. For that, a separate dust container was  
provided to collect the contaminants therein.

However, without a separate handle, the hand of the user is often soiled while  
emptying the dust container. Even with the handle, unless the handle is affixed during  
the movement of the cleaner, the dust container sways and the contaminants therein are  
25 spilled.

Thus, a heretofore unaddressed need exists in the industry to address the  
aforementioned deficiencies and inadequacies.

## SUMMARY OF THE INVENTION

Accordingly, one aspect of the present invention is to provide a dust container with an improved handle capable of mechanically recovering to a seated position with the closing movement of the dust container, and a vacuum cleaner having the same.

5 To achieve the above aspect of the present invention, the dust container includes a container body, a handle pivotably disposed at the dust container, a guide incline to slidably contact with and resiliently deform the handle in a pivotal axis direction while the handle pivots, and a fixing rib disposed at the guide incline to restrain a pivoting angle of the handle.

10 According to an embodiment of the present invention, the dust container is formed of a transparent material.

The container body includes a first container having a diameter corresponding to an outer circumference of a cleaner body which is formed in a cylindrical shape, and a second container formed in a stepped manner with respect to the first container and  
15 having a bottom side which is less than an open upper side of the first container. The first container has a concave portion at the bottom side so that a user can use it as a grip.

The handle has both ends partially bent to form pivotal shafts. The handle is a wire member which is bent in a shape corresponding to the outer circumference of the dust container.

20 A vacuum cleaner with the dust container including the handle comprises a cleaner body, wherein the dust container is removably received in the cleaner body and includes an open upper side and a suction port which is connected to an extension pipe at a side thereof. The vacuum cleaner also includes a handle pivotably connected to the dust container, and a guide incline to slidably contact with and resiliently deform the  
25 handle in a pivotal axis direction as the handle pivots. A fixing rib is disposed at the guide incline to restrain a pivoting angle of the handle. A sealing cover covers the

open upper side of the dust container. The cleaner body includes a receiving portion to receive the dust container therein, and a contaminants check window formed by penetrating an outside of the vacuum cleaner. The sealing cover has one end connected to a suction motor disposed in the cleaner body, and the other end connected to the opening of the dust container. The sealing cover includes a filtering portion therein to filter and collect contaminants in the dust container. The handle mechanically recovers to a seated position due to a covering operation of the sealing cover.

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## BRIEF DESCRIPTION OF THE DRAWINGS

Many aspects of the invention can be better understood with reference to the following drawings. The components in the drawings are not necessarily to scale, emphasis instead being placed upon clearly illustrating the principles of the present invention. Moreover, in the drawings, like reference numerals designate corresponding parts throughout the several views.

Fig. 1 is a perspective drawing view showing a vacuum cleaner according to an embodiment of the present invention;

Fig. 2 is an exploded perspective drawing view showing the vacuum cleaner according to an embodiment of the present invention;

Fig. 3 is a perspective drawing view showing a guide incline of Fig. 2;

Fig. 4 is a plane drawing view showing the guide incline of Fig. 3;

Fig. 5 is a side drawing view of a dust container with a handle that mechanically recovers to a seated position according to an embodiment of the present invention;

Fig. 6 is a bottom drawing view showing the dust container of Fig. 5; and

Fig. 7 is a perspective drawing view showing the operation of the handle of the dust container according to the certain embodiment of the present invention.

## DETAILED DESCRIPTION OF THE EMBODIMENT

Hereinafter, an embodiment of the present invention will be illustrated in greater detail with reference to the drawings.

As shown in Fig. 1, a vacuum cleaner with a large-capacity according to one  
5 embodiment of the present invention includes a cleaner body 10, a suction brush 20 to suction contaminants on a surface in contact with the suction brush 20, an extension pipe 30 detachably connected to the suction brush 20 and a flexible hose 40 interconnecting the extension pipe 30 and the cleaner body 10. The cleaner body 10 includes a dust container 100 which is received in the cleaner body 10 to collect the  
10 contaminants therein. The dust container 100 includes a handle 110 (Fig. 2) so that a user can conveniently pull out the dust container 100 from the cleaner body 10.

In detail, the dust container 100, as shown in Figs. 2 through 5, includes a container body 101, the handle 110, a guide incline 120, and a flexible rib 130. The container body 101 has an open upper side and a suction port P at a side in fluid  
15 connection with the extension pipe 30. The handle 110 is pivotably disposed at the container body 101. The guide incline 120 resiliently deforms the handle 110 in a pivotal axis direction of A while slidably contacting with the handle 110 when the handle 110 pivots. The fixing rib 130 is disposed at the guide incline 120 to restrain the pivoting angle of the handle 110. The container body 101 may be formed of a  
20 transparent material through which contents may be viewed. Preferably, the container body 101 is fabricated by molding a resin material. The suction port P may be provided with a predetermined duct member (not shown) having an outlet toward the bottom side of the dust container 100 to guide contaminants-laden air to a lower part of the container body 101.

25 As shown in Fig. 5, the container body 101 includes a first container 101a and a second container 101b. The first container 101a has a diameter corresponding to an

inner circumference of the cleaner body 10 which is formed in a cylindrical shape.

The second container 101b is shaped and configured in a stepped manner with respect to the first container and has a bottom side which is smaller than the open upper side of the first container 101a.

5           Unlike a conventional large-sized vacuum cleaner, a vacuum cleaner according to an embodiment of the claimed invention has a vacuum motor (not shown) for generating suction force located in the cleaner body 101. Accordingly, the container body 101 is divided into the first and the second containers 101a, 101b in a stepped manner to prevent interference between the vacuum motor portion and the dust  
10 container 100. Hence, the second container 101b is structurally smaller than the first container 101a. As shown in Fig. 6, the second container 101b includes a concave portion 102 at the bottom side for a user to use as a grip. The concave portion 102 facilitates gripping of the dust container 100 when the user dumps the collected contaminants. More specifically, the user grips the handle 110 with one hand and the  
15 concave portion 102 with the other hand to dump the contaminants of the dust container 100 in an orderly manner.

The handle 110 has both ends partially bent to form a pivotal shaft 110a (Fig. 4). The pivotal shaft 110a freely pivots upon insertion into an insertion hole 101c disposed at the dust container 100. The handle 110 is formed preferably of a wire member  
20 which is bent in a shape corresponding to an outer circumference of the dust container 100. Thus, when the dust container 100 is received in a receiving portion 12 disposed in the cleaner body 10, the handle 110 is laid on the outer circumference of the dust container 100 and seated in a position lower than an opening 103 of the dust container 100.

25           The guide incline 120 is formed preferably adjacent to the pivotal shaft 110a where the handle 110 is connected. As shown in Fig. 5, if the dust container 100 is



received in the cleaner body 10 and the handle 110 is at a first position (S1), the guide incline 120 does not interfere with the handle 110. If the handle 110 is pivoted and fixed at a second position (S2), the guide incline 120 contacts and slides with the handle 110 and resiliently deforms the handle 110 in the pivotal axis direction of A.

5 Preferably, a sliding incline 121 and a sliding plane 122 are provided. The sliding incline 121 resiliently deforms the handle 110 in the pivotal axis direction of A. the sliding plane 122 maintains the maximum height of the sliding incline 121 over a predetermined section to fix the handle 110 at a portion where a fixing rib 130 is disposed. The handle 110 at the sliding plane 122 is fixed at the second position (S2),  
10 because a bearing force of the sliding plane 122. Meanwhile, if an external force is applied to pivot the handle 110 toward the first position (S1), the handle 110 leaves the sliding plane 122. Due to the recovery force, the handle 110 is in close contact with the sliding incline 121. Hence, the handle 110 slides along the sliding incline 121 and recovers to the first position (S1) without having to apply a separate force.

15 The fixing rib 130 restrains a pivoting angle  $\alpha$  of the handle 110 and is disposed at a position at which the handle can pivot up to approximately 90 degrees. As shown in Fig. 5, the handle 110 is bent by a predetermined angle  $\beta$  to prevent interference with respect to a sealing cover 13 (Fig. 2), at the first position (S1). Thus, it is preferable that the pivoting angle  $\alpha$  is greater than 90 degrees.

20 A vacuum cleaner having the dust container 100 which includes the handle 110 as shaped and configured above, includes the cleaner body 10, the dust container 100, the handle 110, the guide incline 120, the fixing rib 130, and the sealing cover 13. The dust container 100 is removably received in the cleaner body 10 and has the open upper side and the suction port P at a side in fluid connection with the extension pipe 30.

25 The handle 110 is pivotably disposed at the dust container 100. The guide incline 120 slidably contacts with and resiliently deforms the handle 110 in the pivotal axis

direction of A when the handle 110 pivots. The fixing rib 130 is disposed at the guide incline 120 to restrain the pivoting angle of the handle 110. The sealing cover 13 covers the opening 103 which is formed at the upper side of the dust container 100.

The cleaner body 10 includes the receiving portion 12 to receive the dust container 100 therein, and a contaminants check window 11 formed by penetrating an outside of the vacuum cleaner. By looking into the inside of the dust container 100 through the contaminants check window 11, the user can check the amount of collected contaminants in the dust container 100. Thus, additional equipment is not needed to measure the amount of the collected contaminants.

Although not shown in the drawings, one end of the sealing cover 13 is connected to the suction motor (not shown) disposed in the cleaner body 10, and the other end is sealingly connected to the opening 103 of the dust container 100. The sealing cover 13 may be provided with a filtering member (not shown) therein. Accordingly, contaminants which are collected due to a suction force generated by the suction motor, are filtered by a filtering unit and stacked in the dust container 100.

Referring to Fig. 2, as the sealing cover 13 covers the opening 103, the handle 110 methodically recovers to a seated position. Therefore, without having to recover the handle 110 to the seated position, i.e., the first position (S1), the user only covers the sealing cover 13 over the opening 103 to thereby conveniently return the handle 110 to the first position (S1).

In an embodiment of the claimed invention, the dust container is provided with a grip portion such as the concave portion which is not soiled, and the user can conveniently grip and pull out the dust container from the cleaner body. Also, while dumping the collected contaminants, the user does not dirty his/her hands due to the collected contaminants. As the dust container is pulled out, the handle is fixed at a predetermined position. Thus, the dust container does not sway and the collected

contaminants are not spilled when the dust container is received in the vacuum cleaner.

The handle self returns to the seated position as the sealing cover covers the opening.

Although a few embodiments of the present invention have been shown and described, the present invention is not limited to the disclosed embodiments. Rather, it  
5 would be appreciated by those skilled in the art that changes and modifications may be made in those embodiments without departing from the principles and spirit of the invention, the scope of which is defined by the claims and their equivalents.